NUMERICAL 9TH

CHAPPTER # 01

1.1
(a) 5000g
$5x10^3$g = 5kg
(b) 2000000W
= $2x10^6$W = 2MW
(c) $52x10^{-10}$kg
= $52x10^{-10}x10^3$g
= $52x10^{-7}$g
= $5.2x10^{-6}$g
=5.2ug
(d) $225x10^{-10}$s
= $2.25x10^{-6}$s
= 2.25us

$1p=10^{-12}$ / $1n=10^{-9}$
$1u=10^{-6}$ / $1u=10^{3}n$
$1n=10^{3}$ / $1u=10^{6}p$

1.3
بال بڑھنے کی شرح
= V = d/t
= 1mm/1 day
= $1x10^{-3}$/86400
= $1.157x10^{-5}x10^{-3}$
= $1.157x10^{-8}$
= $11.57x10^{-9}$
= 11.57nm/s

1.4
(a) $1168x10^{-27}$
= $1.168x10^{-27+3}$
= $1.168x10^{-24}$
(b) $32x10^{5}$
= $3.2x^{5+1}$ = $3.2x10^{6}$
(c) $725x10^{-5}$kg
= $725x10^{-5}x10^{3}$g
= $725x10^{-2}$g
= 7.25g
(d) $0.02x10^{-8}$ =
$2x10^{-8-2}$ =$2x10^{-10}$

1.5
(a) 6400km
=$6.4x10^3$km
(b) 380000km
=$3.8x10^5$km
(c) 300000000m/s
=$3x10^8$m/s
(d)ایک دن میں سیکنڈ =
=24x60x60s
=86400s
=$8.64x10^4$s

1.6
زیرو ایرر =0.01x4
= 0.04cm
زیرو کوریکشن = -0.04cm

1.7
درجوں کی تعداد = 50
سکریو کی پچ = 0.5mm
L.C = pitch/darje
= 0.5/50 = 0.01cm

1.8
0.00309kg = 3
$5.05x10^{-27}$ = 3

1.9
1.009m 4
0.00450kg=3
$1.66x10^{-27}$kg=3
2001s=4

1.10
لمبائی = 6.7cm
چوڑائی = 5.4cm
رقبہ = LxW =6.7x5.4
$36.78cm^2$=$36cm^2$

CHAPPTER # 02

2.1
V=36km/h
=36x1000m/3600
V =10m/s
t = 10s
S = Vxt
=10x10=100m

2.2
V_i = 0
S = 1000m
t = 100s
V_f =?
S = V_it + ½ at^2
1000 = 0x100 + ½
x a x $(100)^2$
a = $0.2m/s^2$
V_f = Vi + at
=0+0.2x100=20m/s

2.3
V_i = 10m/s
a = $0.2m/s^2$
t = 30s
S = ?
V_f = ?
V_f = V_i + at^2
= 10+0.2x30
= 10+6=16m/s
S = V_it + ½ at
=10x30+½0.2$(30)^2$
=300+½0.2x900
=300+90=390m

2.4
V_i = 30m/s
V_f = 0
g = $-10m/s^2$
h = ?
2gh = V_f^2 – V_i^2
2(-10)h=$(0)^2$-$(30)^2$
-20h = -900
h = -900/-20
h = 45m
واپسی کا ٹائم =t=3s

2.5
پانچ سیکنڈ میں طے فاصلہ
V_i = 40m/s
t = 5s
S_1 = Vxt
S_1 = 40x5=200m
دس سیکنڈ میں طے فاصلہ
V_i = 40m/s
V_f = 0
t = 10s
V_{av}=V_f–V_i/2
= 0+40/2 = 20m/s
S_2 = Vxt
S_2 = 20x10=200m
کل فاصلہ = S_1+S_2
=200+200=400m
Retardation
a_{av} = V_f–V_i/t
=0-40/10=-40/10
=$-4m/s^2$

2.6
Vi = 0
a = 0.5m/s2
S = 100m
V_f = ?
2aS = V_f^2 – V_i^2
2(0.5)100=V_f^2-$(0)^2$
V_f^2 = 100
V_f = $10m/s^2$
V_f = 10x3600/1000
V_f = 36km/h

2.7
دو منٹ میں طے فاصلہ
V_i = 0
V_f = 48km/h
=13.33m/s
t = 2mint=2x60
= 120s
V_{av} = V_f-V_i/2
= 0+13.33/2
=6.66m/s
S_1 = V_{av}xt
=6.66x120
=800m
پانچ منٹ میں طے فاصلہ
V = 13.33m/s
t = 5mint=5x60
= 300s
S_2 = Vxt
=13.66x300
=4000m
تین منٹ میں طے فاصلہ
V_i = 13.66m/s
V_f = 0
t = 3mint=3x60
= 180s
V_{av} = V_f-V_i/2
=0+13.66/2
=6.66m/s
S_3 = V_{av}xt
=6.66x180
=1200m
کل فاصلہ = S_1+S_2+S_3
=800+4000+1200
=6000m

2.8
اوپر جانے کا وقت =
t = 6/2 = 3s
g = $-10m/s^2$
V_f = 0
h = ?
V_i = ?
V_f = V_i + gt
0 = V_i + (-10)x3
V_i = 30m/s
2gh = V_f^2-V_i^2
2(-10)h=(0)2-(30)2
-20xh=-900
h=-900/-20=45m

2.9
S = 800m
V_i = 96km/h
= 26.67m/s
V_f = 48km/h
= 13.33m/s
a = ?
2aS = V_f^2-V_i^2
2xax800 =
$(13.33)^2$-$(26.67)^2$
1600xa =
177.68-711.28
a = -533.6/1600
= $-0.3335m/s^2$
اس ایکسلریشن سے طے فاصلہ
V_i = 13.33m/s
V_f = 0
a = $-0.3335m/s^2$
S = ?
2aS = V_f^2-V_i^2
2x(-0.3335)xS =
$(0)^2$-$(13.33)^2$

0.667xS = -177.66
S = -177.66/-0.667
S = 266.4m

2.10
V_i = 26.67m/s
V_f = 0
a = -0.3335m/s^2
$V_f = V_i + at$
t = Vf-Vi/a
t = 0-26.67/-0.3335
t = 80s

CHAPPTER # 03

3.1
F = 20N
a = 2m/s^2
F = ma
m = F/a
= 20/2 = 10kg

3.2
W = 147N
g = 10m/s^2
W = mg
m = W/g
= 147/10=14.7kg

3.3
m = 10kg
g = 10m/s^2
W = mg => F
= 10x10 = 100N

3.4
F = 100N
m = 50kg
F = ma
a = F/m
= 100/50 = 2m/s^2

3.5
W = 20N
a = 2m/s^2
g = 10m/s^2
W = mg
m = W/g
= 20/10 = 2kg
F = ma
= 2x2 = 4N
ساری فورس = W+F
F = 20+4 = 24N

3.6
m_1 = 52kg
m_2 = 48kg
g = 10m/s^2
a = $\frac{(m_1-m_2)g}{m1+m2}$
=(52-48)x10/52+48
=4x10/100=40/100
a = 0.4m/s^2
T = $\frac{2m_1m_2g}{m_1+m_2}$
=2x52x48x10/100
=49920/100
T = 500N

3.7
m_1 = 24kg
m_2 = 26kg
g = 10m/s^2
a = $\frac{m_1g}{m_1+m_2}$
= 24x10/24+26
a=240/50=4.8m/s^2
T = m_1m_2g/m_1+m_2
=24x26x10/24+26
T= 6240/50=125N

3.8
ΔP = 22Ns
F = 20N
F = ΔP/t
t = ΔP/F = 22/20
t = 1.1s

3.9
m = 5kg
μ = 0.6
F_s = μF = μmg
F_s= 0.6x5x10=30N

3.10
m = 0.5kg
r = 50cm
r = 50/100 = 0.5m
v = 3m/s
$F_c = mv^2/r$
= 0.5x$(3)^2$/0.5=9N

CHAPPTER # 04

4.1
F_x = 10-4 = 6N
F_y = 6N
F = $\sqrt{Fx^2 + Fy^2}$
F = $\sqrt{6^2 + 6^2}$
F = $\sqrt{72}$ = 8.5N
$\theta = \tan^{-1}(F_y/F_x)$
$\theta = \tan^{-1}(6/6)$
$\theta = \tan^{-1}(1) = 45^0$

4.2
F = 50N
$\theta = 30^0$
$F_x = F\cos\theta$
= 50cos30^0
=50x0.866=43.3N
$F_y = F\sin\theta$
= 50sin30^0
= 50x0.5 = 25N

4.3
F_x = 12N
F_y = 5N
F = $\sqrt{Fx^2 + Fy^2}$
F = $\sqrt{12^2 + 5^2}$
F = $\sqrt{169}$ = 13N
$\theta = \tan^{-1}(F_y/F_x)$
$\theta = \tan^{-1}(5/12)$
= $22.6^{0=}$

4.4
F = 100N
r = 10cm = 0.1m
τ = rF
= 0.1x100 = 10Nm

4.5
F_x = 20N
$\theta = 30^0$
$F_x = F\cos\theta$
$F = F_x/\cos\theta$
= 20/cos30^0
= 20/0.866
= 23.1N

4.6
F = 50N
r = 16cm = 0.16m
کپل کا ٹارک =
τ = 2rF
=2x0.16x50=16Nm

4.7
T_1 = 3.8N
T_2 = 4.4N
$W = T_1 + T_2$
= 3.8+4.4 = 8.2N

4.8
m_1 = 3kg
m_2 = 5kg
T_1 = mg
= 3x10 = 30N
$T_2 = (m_1+m_2)g$
= (3+5)x10
= 80N

4.9
F_1 = 200N
r_1 = 20cm = 0.2m
F_2 = 150N
r_2 = ?
$τ_1 = τ_2$
$F_1r_1 = F_2r_2$
$r_2 = F_1r_1/F_2$
= 0.1x200/150
=0.133m=13.3cm

4.10
m = 10kg
F_1 = mg
F_1=10x10=100N
r_1 = 20cm = 0.2m
r_2 = 50cm = 0.5m
F_2 = ?
اینٹی کلاک وائز = کلاک وائز
$F_2r_2 = F_1r_1$
$F_2 = F_1r_1/r_2$
= 100x0.2/0.5
= 20/0.5=40N

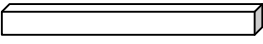
CHAPPTER # 05

5.1
m_1 = 1000kg
m_2 = 1000kg
d = 0.5m
G = 6.67x10^{-11} Nm^2kg^{-2}
F = Gm_1m_2/d^2
=Gx10^3x10^3/$(0.5)^2$
=**6.67x10^{-11}x10^6/0.25**
= 26.7x10^{-11+6}
= 26.7x10^{-5}
= 2.67x10^{-4} N

5.2
m = $m_1 = m_2$ =?
F = 0.006673N
d = 1m
G = 6.67x10^{-11} Nm^2kg^{-2}
F = Gm_1m_2/d^2
$m^2 = Fxd^2/G$
= $\frac{0.006673(1)^2}{6.673x10-11}$
= $\frac{6.673x10^{-3}}{6.673x10^{-11}}$
m^2 = 1x10^{-3+11}
= 10^8
$\sqrt{m2}$ = /$(10^4)^2$
m = 10000kg

5.3
M_m = 6.42x10^{23}kg
R_m = 3370km
= 3.370x10^6m
G = 6.67x10^{-11} Nm^2kg^{-2}
$g_m = GM_m/R^2$
= $\frac{6.673x10^{-11}x6.42x10^{23}}{(3.370x10^6)^2}$
= $\frac{42.84x10^{23-11}}{11.35x10^{12}}$
= 3.77x10^{12-12}
= 3.77x10^0
g_m = 3.77m/s^2

5.4
g_m = 1.62m/s^2
R_m = 1740km
= 1.740x10^6m
G = 6.67x10^{-11} Nm^2kg^{-2}
$M_m = g_mR^2/G$
= $\frac{1.62x(1.74x10^6)^2}{6.673x10^{-11}}$
= $\frac{1.62x3.027x10^{12}}{6.673x10^{-11}}$
= $\frac{4.904712x10^{12+11}}{6.673}$
= 0.735x10^{23}
M_m = 7.35x10^{22}kg

5.5
h = 3600km
= 3.6x10^6m

$R = 6.4\times10^6 m$
$M_e = 6\times10^{24} kg$
$g_m = GM/(R+h)^2$
$= \frac{6.67\times10^{-11}\times6\times10^{24}}{(6.4\times10^6+3.6\times10^6)^2}$
$= \frac{40.038\times10^{24-11}}{[(6.4+3.6)\times10^6]^2}$
$= \frac{40.038\times10^{13}}{(10\times10^6)^2}$
$= \frac{40.038\times10^{13}}{100\times10^{12}}$
$= 0.4\times10^{13-12}$
$= 0.4\times10^1$
$g_m = 4 m/s^2$

5.6
$R = 48700 km$
$= 48.7\times10^6 m$
$g = GM/R^2$
$= \frac{6.67\times10^{-11}\times6\times10^{24}}{(48.7\times10^6)^2}$
$= \frac{40.038\times10^{24-11}}{2371.69\times10^{12}}$
$= 0.017\times10^{13-11}$
$= 0.017\times10^1$
$g = 0.17 m/s^2$

5.7
$R = 10000 km$
$= 10^7 m$
$g = 4 m/s^2$
$M_e = gR^2/G$
$= \frac{4\times(10^7)^2}{6.67\times10^{-11}}$
$= 0.599\times10^{14+11}$
$= 0.599\times10^{25}$
$M = 5.99\times10^{24} kg$

5.8
$g_h = ¼ g$
$g_h = GM/(R+h)^2$
$(R+h)^2 = GM/g_h$
$= GM/ ¼ g$
$(R+h)^2 = 4GM/g$
دونوں طرف جذرلی
$/(R+h)^2 = /4GM/g$
$R+h = /4R^2$
$R+h = 2R$
$h = 2R-R$
$h = R$

5.9
$h = 850 km$
$h = 0.85\times10^6 m$
$V_0 = (GM/R+h)^{1/2}$
$= \frac{(6.673\times10^{-11}\times6\times10^{24})^{1/2}}{(0.85\times10^6+6.4\times10^6)^{1/2}}$
$= \frac{(40.038\times10^{13})^{1/2}}{[(0.85+6.4)10^6]^{1/2}}$
$= (\frac{40.038}{7.25}\times10^{13-6})^{1/2}$
$= (5.522\times10^7)^{1/2}$
$= (55.22\times10^6)^{1/2}$
$= 7.431\times10^3$
$V_0 = 7431 m/s$

5.10
$h = 42000 km$
$= 42\times10^6 m$
$V_0 = (GM/R+h)^{1/2}$
$= \frac{(6.673\times10^{-11}\times6\times10^{24})^{1/2}}{(42\times10^6+6.4\times10^6)^{1/2}}$
$= \frac{(40.038\times10^{24-11})^{1/2}}{[(42+6.4)10^6]^{1/2}}$
$= (\frac{40.038}{48.4}\times10^{13-6})^{1/2}$
$= (0.8272\times10^7)^{1/2}$
$= (8.272\times10^6)^{1/2}$
$= 2.876\times10^3$
$V_0 = 2876 m/s$

CHAPPTER # 06

6.1
$F = 300N$
$d = 35m$
$W = Fd$
$= 300\times35 = 10500J$

6.2
$W = mg = 20N$
$h = 6m$
$P.E = mgh$
$= 20\times6 = 120J$

6.3
$W = 12kN$
$= 12000N$
$V = 20 m/s$
$m = W/g$ (w=mg)
$=12000/10=1200 kg$
$K.E = ½ mV^2$
$= ½ \times1200\times(20)^2$
$= 600\times400$
$= 240000$
$= 240\times10^3 = 240kJ$

6.4
$m = 500g$
$= 0.5kg$
$V = 15 m/s$
$K.E = ½ mV^2$
$= ½ \times500\times(0.5)^2$
$= 0.5\times225/2$
$K.E = 56.25J$
کنزرویشن آف انرجی کے قانون کے مطابق
$P.E = 56.25J$

6.5
$h = 6m$
$V = 1.5 m/s$
$m = 40kg$
$P.E = mgh$
$= 40\times10\times6 = 2400J$
$K.E = ½ mV^2$
$= ½ 40\times(1.5)^2$
$= 20\times2.25 = 45J$

6.6
$V = 4 m/s$
$F = 4000N$
$P = W/t = F.d/t$
$P = F.V = 4000\times4$
$= 16000W = 16kW$

6.7
$F = 300N$
$d = 50m$
$t = 60s$
$P = W/t = F.d/t$
$P = 300\times50/60$
$= 250W$

6.8
$m = 50kg$
$t = 20s$
سیڑھی کی لمبائی = 16cm
$= 16/100 = 0.16m$
سیڑھیوں کی تعداد = 25
$h = 25\times0.16 = 4m$
$P = W/t = mgh/t$
$= 50\times10\times4/20$
$= 100W$

6.9
$m = 200kg$
$h = 6m$
$t = 10s$
$P = W/t = mgh/t$
$= 200\times10\times6/10$
$= 1200W$

6.10
$P = 1hp = 746W$
$t = 10mint = 600s$
$m = 800kg$
$h = 15m$
$W = P\times t$ (P=W/t)
$= 746\times600$
input = 447600J
$W = mgh$
$= 800\times10\times15$
output = 120000J
$E_f =$ (output/input)100
$= \frac{120000}{447600}\times100$
$E_f = 26.8\%$

CHAPPTER # 07

7.1
$m = 850g$
$=850/1000=0.85kg$
$V =40cm\times10cm\times5cm$
$= \frac{40m}{100}\times\frac{10m}{100}\times\frac{5m}{100}$
$= 0.4m \times 0.1m \times 0.05m$
$V = 0.002 m^3$
$\rho = m/V$
$= 0.85/0.002$
$= 425 kg/m^3$

7.2
$m = 1L = 1kg$
$\rho = 0.92 kg/L$
$V = m/\rho$
$= 1/0.92 = 1.09L$

7.3
(a) $m = 5kg$
$\rho = 8200 kg/m^3$
$V = m/\rho = 5/8200$
$= 6.01\times10^{-4} m^3$
(b) $m = 200g$
$= 200/1000 = 0.2kg$
$\rho = 11300 kg/m^3$
$V = m/\rho=0.2/11300$
$= 1.77\times10^{-5} m^3$
(c) $m = 0.2kg$
$\rho = 19300 kg/m^3$
$V = m/\rho=0.2/19300$
$= 1.04\times10^{-5} m^3$

7.4
$\rho = 1.3 kg/m^3$
$V = 8m \times 5m \times 4m$
$= 160 m^3$
$m = \rho \times V$
$= 160\times1.3$
$=208kg$

7.5
$F = 75N$
$A = 1.5cm^2$
$= \frac{1.5m}{100}\times\frac{1.5m}{100}$
$= 0.015m \times 0.015m$
$= 0.000225 m^2$
$P = F/A$
$= 75/0.000225$
$= 3.33\times10^5 Pa$

7.6
$L = 10mm$
$= 10/1000 = 0.01m$
$A = L\times L=0.01\times0.01$
$= 1\times10^{-4} m^2$
$F = 20N$
$P = F/A = 20/10^{-4}$
$= 2\times10^5 N/m^2$

7.7
$m=1000g=1kg$
$A = 7.5cm \times 7.5cm$
$= \frac{7.5m}{100}\times\frac{7.5m}{100}$
$= 0.075m \times 0.075m$
$A = 0.005625 m^2$
$F = mg$
$= 1\times10 = 10N$
$P = F/A$

$= 10/0.005625$
$= 1778 N/m^2$

$V = \frac{20cm}{100} \times \frac{7.5\,cm}{100} \times \frac{7.5cm}{100}$
$= 0.2m \times 0.075m \times 0.075m$
$V = 0.001125 m^3$
$\rho = m/V$
$= 1/0.001125$
$= 888.89 kg/m^3$

کیوب کے ماس اور ڈینسٹی کے لحاظ سے اس کا اصل والیوم **7.8**
$m = 306g$
$\rho = 2.55 g/cm^3$
$V_0 = m/\rho$
$= 306/2.55$
$= 120 cm^3$
کیوب کی شکل کی وجہ سے اس کا والیوم
$V_s = 5x5x5 = 125 cm^3$
کیویٹی کا والیوم $= V_c = V_s - V_o$
$V_c = 125-120 = 5 cm^3$

$W_{air} = 18N$ **7.9**
$W_{water} = 11.4N$
$D = (W_{air}/W_{air}-W_{wat})\rho$
$D = (18/6.6)x1000$
$= 2727 kg/m^3$ **(Al)**

$W = 3.06N$ **7.10**
$m = W/g = 3.06/10$
$= 0.306kg = 306g$
$\rho = 0.6 g/cm^3$
(a) $V = m/\rho$
$= 306/0.6 = 510 cm^3$
(b) $V = m/\rho$
$= 306/0.9 = 340 cm^3$

$F_2 = 20000N$ **7.11**
پریس کے پسٹن کا ایریا
$D = 30cm$
$R = D/2 = 30/2$
$= 15cm = 0.15m$
$A = \pi R^2$
$= 3.14x(0.15)^2$
$= 0.07065 m^2$
پمپ کے پسٹن کا ایریا
$d = 3cm$
$r = d/2 = 3/2$
$= 1.5cm = 0.015m^2$
$a = \pi r^2$
$= 3.14x(0.015)^2$
$= 0.0007065 m^2$
$F_2/A = F_1/a$
$F_1 = F_2 xa/A$
$= \frac{20000x0.0007065}{0.07065}$
$F_1 = 14.13/0.07065$
$F_1 = 200N$

$A = 2x10^{-5} m^2$ **7.12**
$F = 4000N$
اصل لمبائی $= L = 2m$
$\Delta L = 2mm$
$= 2/1000 = 0.002m$
$Y = FxL/Ax\Delta L$
$= 4000x2/2x10^{-5}x.002$
$= 8000/4x10^{-8}$
$Y = 2x10^{11} N/m^2$

CHAPPTER # 08

$C = 50^0C$ **8.1**
$F = 1.8^0C+32$
$= 1.8x50+32$
$F = 122^0F$

$F = 98.6^0F$ **8.2**
$C = (F-32)/1.8$
$= (98.6-32)/1.8$
$= 37^0C$
$K = C+273$
$= 37+273$
$= 310K$

$L_0 = 2m$ **8.3**
$T_1 = 0^0C = 273K$
$T_2 = 20^0C = 293K$
$\alpha = 2.5x10^{-5} K^{-1}$
$\Delta L = \alpha L_0(T_2-T_1)$
$= 2.5x10^{-5}x2(293-273)$
$= 2.5x10^{-5}x2(20)$
$= 2.5x40x10^{-5}$
$= 100/10^5$
$= 0.001m = 0.1cm$

$V_0 = 1.2m^3$ **8.4**
$T_1 = 15^0C = 288K$
$T_2 = 40^0C = 313K$
$\beta = 3.67x10^{-3} K^{-1}$
$V = V_0(1+\beta\Delta T)$
$= 1.2[1+3.67x10^{-3}(313-288)]$
$= 1.2[1+3.67x10^{-3}(25)]$
$= 1.2[1+0.09175]$
$V = 1.3m^3$

$m = 0.5kg$ **8.5**
$T_1 = 10^0C = 283K$
$T_2 = 65^0C = 338K$
$C = 4200 J/kgK$
$\Delta Q = Cm\Delta T$
$= 0.5x4200(338-283)$
$= 05x4200x55$
$\Delta Q = 115500J$

$\Delta Q = 1000 J/s$ **8.6**
$m = 200g = 0.2kg$
$T_1 = 20^0C = 293K$
$T_2 = 90^0C = 363K$
$Q = Cm\Delta T/t$
$t = 4200x0.2(363-293)/Q$
$t = 840(70)/1000$
$t = 58800/1000$
$t = 58.8s$

$\Delta Q = 50000J$ **8.7**
$H_f = 336000 K/kg$
$m = \Delta Q/H_f$ $(\Delta Q = H_f m)$
$m = 50000/336000$
$= 0.149kg$
$= 150g$

$m = 100g = 0.1kg$
برف کو گرم کرنے کے لیے درکار حرارت
$Q_1 = Cm\Delta T$ $(-10\rightarrow 0)$
$= 2100x0.1[0-(-10)]$
$Q_1 = 2100J$ **8.8**
برف کو پگھلانے کے لیے درکار حرارت
$Q_2 = mH_f$ $(@\ 0^0C)$
$= 0.1x336000$
$Q_2 = 33600J$
پانی کو گرم کرنے کے لیے درکار حرارت
$Q_3 = Cm\Delta T$ $(0\rightarrow 10)$
$= 4200x0.1(10-0)$
$Q_3 = 4200J$
کل حرارت $= Q_1+Q_2+Q_3$
$= 2100+33600+4200$
$Q = 39900J$

$m = 100g = 0.1kg$
$T = 100^0C$ **8.9**
$H_v = 2.26xx10^6 J/kg$
$\Delta Q = mH_v$
$= 0.1x2.26x10^6$
$= 2.26x10^5 J$

$m_{steam} = 5g$ **8.10**
$= 5/1000 = 0.005kg$
$m_{water} = 500g$
$= 500/1000 = 0.5kg$
پانی کی پہلے ٹمپریچر سے آخری ٹمپریچر تک اپنے ماس کے لحاظ سے جذب کردہ حرارت
$Q_p = Cm\Delta T$
$= Cm(T_2-T_1)$
$= 2100x0.5(T_2-10)$
$= 2100T_2-21000$
ماس کے لحاظ سے بھاپ کی خارج کردہ حرارت
$Q = mH_v$
$= 0.005x2.26x10^6$
$= 11300J$
بھاپ کی پہلے ٹمپریچر سے آخری ٹمپریچر تک جاتے ہوئے خارج کردہ حرارت
$Q = Cm\Delta T$
$= 4200x0.005(100-T_2)$
$= Q = 2100-21T_2$
پانی کی جذب کردہ حرارت = بھاپ کی خارج کردہ حرارت
$2100T_2-2100=$
$11300+2100-21T_2$
$2100T_2+21T_2=$
$11300+2100+21000$
$2121T_2 = 34400$
$T_2 = 34400/2121$
$T_2 = 16.21^0C$

CHAPPTER # 09

$A = 200m^2$ **9.1**
$L = 20cm = 0.2m$
$T_1 = 15^0C = 288K$
$T_2 = 35^0C = 308K$
$k = 0.65 W/mK$
$Q/t = kA(T_2-T_1)/L$
$= \frac{0.65x200(308-288)}{0.2}$
$= 130x(20)/0.2$
$= 13000 J/s$

$A = 2x2.5 = 5m^2$ **9.2**
$L = 0.8cm = 0.008m$
$t = 1hr = 3600s$
$T_1 = 5^0C = 278K$
$T_2 = 25^0C = 298K$
$k = 0.8 W/mK$
$Q = kA(T_2-T_1)xt/L$
$= \frac{0.8x5(298-278)x3600}{0.008}$
$= 4(20)3600/0.008$
$= 288000/0.008$
$= 36000000$
$Q = 3.6x10^7 J$

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